

SCOPE OF CLAIMS

1. A laser detecting and ranging apparatus, comprising
 a light transmitting unit for transmitting a light signal
from a light source as a transmitted beam into the atmosphere,
 a light receiving unit for receiving a light beam from
the atmosphere as a received light,
 an oscillator for outputting a modulating signal having
at least one modulating frequency as a carrier frequency, and
 a signal processing unit for detecting properties of said
atmosphere on the basis of said received light,
 characterized in that said light transmitting unit
includes a light intensity modulator for performing intensity
modulation on the light signal from said light source with said
modulating signal, and that
 said signal receiving means includes
 optical frequency conversion means for converting the
frequency of the intensity-modulated component of said received
light to a base-band frequency, and
 optical detection means for directly detecting an output
signal from said optical frequency conversion means to thereby
convert into an electric signal to be subsequently inputted to said
signal processing unit.
2. A laser detecting and ranging apparatus set forth in
claim 1, characterized in that said optical frequency conversion
means is constituted by an optical mixer, and
 that said optical mixer is designed to modulate intensity
of said received light with a modulating frequency which
approximately equal to a carrier frequency of said modulating
signal.
3. A laser detecting and ranging apparatus set forth in
claim 2, characterized in that said optical mixer includes a light
intensity modulator for modulating at least one of phase,
polarization and amplitude of said received light with a modulating
frequency which is approximately equal to a carrier frequency of

said modulating signal.